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NIE-40 (Economic)

METALS

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SECTOR SUMMARY

METALS

With the notable exceptions of steel and aluminum, metal requirements of Western Europe are customarily met in large part by imports from other areas. Should Western Europe be overrun by Soviet forces and attempts be made to utilize its industries at a high rate, serious difficulties would be encountered in supplying metal-fabricating industries with certain raw materials, but probably none of these shortages would present insurmountable problems.

1. CRUDE STEEL

Steel production in Western Europe in 1951 will be approximately 49,890,000 tons and in Eastern Europe is estimated at 36,825,000 tons, making a total of 77,715,000 tons. The combined output of Western Europe and the Soviet bloc is expected to increase to 82 million metric tons by mid-1952 and to 86 million tons in 1954. These supplies appear ample to sustain civilian requirements for both Eastern and Western Europe and to make a substantial contribution to Soviet military production as well. The level of combined civilian and military production which these quantities of steel could support may be judged by comparing these estimates with the average US annual steel output during 1942-1944 of 80,000,000 tons. Due to bottlenecks in capacity for particular steel products the contribution of the Western European steel industry to direct Soviet military production would be less substantial than the total production of crude steel in Western Europe would indicate. However, the general shortage in the Soviet sphere of steel products for essential civilian uses would cause the Russians to make effective use of Western European steel supplies of almost any grade or type.

2. TIN

Total primary tin production is estimated at 63,700 metric tons during the 3-year period mid-1952 to mid-1955--57,600 tons in the

Soviet bloc and 9,100 tons in Western Europe. In mid-1952 Western European smelter stocks are estimated at 3,500 metric tons and USSR stocks at 9,000 tons.

Products containing tin are vitally important and widely used in an industrial economy, and no country could support large scale industrial production without consuming substantial quantities of tin, particularly for solders and bearing metals. In a war economy the amount of tin in these essential uses can be decreased somewhat, as was done in the US during World War II, but substitutes for most uses have not been developed. Large quantities of tin are ordinarily consumed in Western Europe in making tinplate which is used primarily for food preservation. Although civilian use of tinplate could be almost completely cut off, relatively small quantities would be necessary to provide containers for army rations.

Based on US World War II experience, it is estimated that the combined Eastern and Western European economy would have sufficient tin supplies to produce essential industrial and war materials for the 3-year period mid-1952 to mid-1955. This estimate which assumes optimum supply and conservation conditions would still leave the Soviets as hard pressed for tin as were the Germans during World War II. Furthermore, when the stockpiles were exhausted, probably in 1954, the Soviets would have a tin shortage that would reduce supplies of solders and bearing metals and thus presumably decrease military production.

3. COPPER

All Europe and particularly Western Europe has for years been a deficit area in copper and is expected to remain in this position for the foreseeable future. Under the conditions outlined in NIE-40, Western Europe could probably produce a maximum of 100-125,000 metric tons of primary copper per year from indigenous sup lies in the period

1952-1954. Since Eastern Europe is also a net importer of copper, supplies from this source are unlikely. The supply estimate for Western Europe may be compared with primary consumption in 1949 of 540,000 tons and in 1950 of 650,000 tons. Dependence of Western Europe on indigenous production would require consumption to be cut to about one-fifth of normal levels. Since a substantial recovery of secondary copper is customarily associated with primary consumption, total supplies of copper bearing materials would not be cut as severely. Moreover, it is expected that aluminum would be available for substitution for some uses of copper. US experience suggests that essential civilian requirements for copper amount to about one-quarter of peacetime demand. Application of this proportion to the Western European situation suggests that essential civilian requirements could be met and a slight contribution made to the Soviet war effort. In practice, the Soviets could be expected to grind down the civilian economy much more severely in the short run in order to provide for military production. Under these conditions, it is possible that a munitions program approaching the NATO goal for 1953 could be accomplished in Western Europe.

Soviet bloc production for 1953 is estimated at 318,000 tons and requirements for direct war and war supporting purposes would undoubtedly be high enough to absorb all of this indigenous production as well as all of Western European production of 100-125,000 tons. However, in view of the high potential of Western European industry to produce end items of prime importance to the Soviet war industry, it would seem more likely that Western European copper would be left in Western Europe for accomplishment of a program of the proportions of NATO. The above conclusions are supported by examination of European wartime experience under German domination.

4. ZINC

One striking aspect of the zinc industry of Western Europe and the Soviet bloc as a whole, under blockade conditions, is an excess of metal production capacity. Mine production in the combined area in 1952-1953 is estimated at about 600,000 tons, as shown in the tabulation below and primary metal capacity is estimated at 1,000,000 tons. Most of the excess capacity is in Western Europe, which currently produces about 50 percent of its primary metal from imported concentrates. This excess capacity would be an asset to the Soviets, since production could be shifted to a certain extent if, for example, transport or other difficulties were to arise in a particular area.

Primary Zinc, 1952-1953
(000 metric tons)

	Mine production	Metal production capacity	Consumption
Western Europe	330	650	500
Soviet Bloc	270	350	300
Total	600	1,000	800

Consumption in the combined area is difficult to estimate. The current requirements of the Soviet bloc are probably considerably above metal production of about 225,000 tons per year. Western European consumption in 1951 and 1952, owing to increased production for defense, is expected to total about 470,000 to 500,000 tons annually, even though conservation measures are adopted.

By late 1952, it is probable that essential civilian requirements in Western Europe would be severely restricted to about 100,000 tons per year. Only a small part of this could be met by extraordinary secondary recovery. Thus, in 1952-53, assuming that about 330,000 tons of zinc would be produced annually in Western Europe from domestic ores, over 200,000 tons would be available to support increased military production in Western Europe or in the USSR and satellite countries. The NATO program will require, by mid-1952, about 80,000 to 100,000 tons of zinc annually.

5. LEAD

An examination of the lead industry of Western Europe and the Soviet bloc, shows, as for the zinc industry, a substantial excess of metal production capacity. Mine production in the combined area in 1952-53 is estimated at about 440,000 tons. Primary metal production is estimated at over 900,000 tons. Most of the excess capacity is in Western Europe, which currently produces about 45 percent of its primary metal from imported concentrates.

Primary Lead, 1952-1953
(000 metric tons)

	Mine production	Metal production capacity	Consumption
Western Europe	250	670	470
Soviet Bloc	190	230	250
Total	440	990	720

Consumption in the combined area is difficult to estimate. The current requirements of the Soviet bloc are probably considerably above metal production of about 175,000 tons per year. Western European consumption in 1951 and 1952, owing to increased production for defense, is expected to total about 470,000 tons annually, even though conservation measures are adopted.

Available data on nonferrous metal consumption of Germany and the occupied countries during World War II indicate that essential civilian consumption of lead in Western Europe, were it to be taken over by the Soviets in mid-1952, could be maintained for a year or two by secondary sources of supply. Such primary metal production as could be maintained on Western European ores--probably about 250,000 tons annually--would be used to supplement Soviet supplies, either for military production in Western Europe or in the USSR and satellite countries.

6. COBALT

Cobalt is particularly important in the production of certain types of alloy steels used in military equipment. There will be a

critical shortage of cobalt in Western Europe by mid-1952. Requirements for cobalt in Western Europe and the present Soviet bloc would be at annual rates of 1300 metric tons and 1000 metric tons respectively or a total of 2300 tons. Indigenous annual production of cobalt by mid-1952 is estimated at 100 tons in Western Europe and 1000 tons in the USSR or a total of 1100 tons. Therefore, should Western European access to foreign supplies be cut off in mid-1952 there would be a cobalt shortage in the entire area, with the main impact upon Western Europe.

It may be assumed that the bulk of cobalt available after mid-1952 would be assigned to military production since essential civilian requirements are negligible. The USSR would be able to meet Soviet requirements but not Western European requirements. Where possible, other metals would be substituted for scarce cobalt, especially in Western Europe. The situation should gradually improve during 1953 and 1954 as the result of increased production in the USSR and Finland and reactivation of indigenous production by former producers in Western Europe.

7. MOLYBDENUM

Supplies of molybdenum would be greatly reduced in Soviet-dominated Europe after mid-1952. Production in Western Europe is insignificant, but consumption there totaled about 1,700 metric tons in 1950 and estimated consumption for 1951 is 2,000-2,500 tons. Production of molybdenum in the USSR plus receipts from China do not meet USSR requirements and there is also a shortage in the satellite countries. These deficits could be met by substituting tungsten, which for many uses is superior to molybdenum. Elsewhere in this paper it is estimated that adequate supplies of tungsten would be forthcoming. The available molybdenum should be sufficient to meet the small non-substitutable requirements, e.g., in electronic tubes, in both Western Europe and the Soviet bloc.

8. NICKEL

Western Europe does not mine enough nickel ore to meet even minimum requirements. Indigenous production under intensified efforts might rise to 1,000 metric tons but minimum civilian requirements are estimated at approximately 1,500 tons; direct military requirements would be much higher. Average 1948-50 annual consumption approximated 15,500 metric tons.

The Soviet bloc is self-sufficient in nickel, mainly from USSR output which is not produced in excess of that country's requirements by 7-10,000 metric tons. Requirements of the satellite countries amount to about 2,000 tons. This would leave 5-8,000 tons per year during the period 1952-1954 available for shipment to Western Europe. This amount would more than meet essential civilian demand, but would not support usage at the present rate. Stocks already accumulated in the Soviet bloc could provide additional supplies to support a Western European military production.

9. ALUMINUM

Acquisition of Western European aluminum reduction capacity would increase the Soviet bloc potential of 288,000 metric tons in mid-1952 to 738,500 tons. By 1954 the combined capacity could reach 793,000 tons. In 1950; production in Western Europe was estimated at 223,100 metric tons while consumption was approximately 225,300 metric tons and production is increasing significantly. Production in 1951 is estimated to be about 44 percent over that of 1950, or 321,500 metric tons. Further additions to capacity, plus modernization and concentration in the industry, are expected to increase capacity by mid-1954 to approximately 465,500 metric tons. Estimated production in the Soviet bloc is 221,000 metric tons in 1951 and could be as high as 327,500 tons in 1954. If consumption in

Western Europe were to continue at levels comparable to 1951 demands would be about 360,000 tons in 1954. Consumption in the Soviet bloc is expected to increase at a much slower pace than production facilities would make possible but might reach an estimated 260,000 tons by 1954. Essential civilian consumption is not large in Western Europe and well over-half the total output could be diverted to military production. Substantial quantities would undoubtedly be needed to substitute for other materials, particularly copper.

10. TUNGSTEN

By mid-1952 tungsten production in Western Europe and in the Soviet bloc is expected to be at the rate of 15,000 metric tons per year or 10 percent greater than the 1951 output of 13,815 tons. Of this only 4,750 tons can be expected from Western Europe. Inventories in Russia by mid-1952 are estimated at 10-15,000 tons. Increases in Western European and Soviet bloc annual production rates are projected at 17,450 and 18,200 tons respectively by mid-1953-1954. These supplies appear sufficient to meet all European requirements indefinitely and should be large enough to offset most of the molybdenum deficit by substitution. The sufficiency of these projected tungsten supplies can be measured by comparing them with total 1951 requirements of 18,600 metric tons for the US and Western Europe or with Free World consumption of 11,200 tons in 1943 and 15,335 tons in 1950.

11. VANADIUM

There is no current production of vanadium in Western Europe. During World War II estimated annual capacity in Axis Europe for processing vanadium from iron ore slags was about 1000 metric tons. Production was discontinued after the war. Estimated vanadium production in the Soviet bloc during 1951 is 1425 tons and is expected to attain annual rates of 1725 tons and 1825 tons by mid-1953 and mid-1954

respectively. Current vanadium production in the Soviet bloc apparently meets consumption and stockpile requirements. It is estimated that vanadium requirements for the combined area could be met during the period under consideration by exports from the present Soviet bloc to Western Europe and the reactivation of slag recovery in Germany.

12. MAGNESIUM

Production of magnesium is geared to current market demand, which, in turn, is closely allied to the manufacture of armaments. Plant capacity in Western Europe plus the Soviet bloc, including potential capacity in Western Germany which is partially dismantled, is estimated at 30,500 metric tons per year. Raw materials are available within the area.

13. MANGANESE AND CHROMITE

The USSR produces such large quantities of these metals that the small Western European supplies could easily be augmented to meet all requirements.

ESTIMATED PRODUCTION AND APPARENT CONSUMPTION OF SELECTED METALS CONTINENTAL WESTERN EUROPE AND SOVIET BLOC 1951, Mid-1952 and Mid-1954

	Unit	1951 Production[b] Continental Western Europe	1951 Production[b] Soviet Bloc	1951 Production[b] Total	1951 Apparent Consumption Continental Western Europe	1951 Apparent Consumption Soviet Bloc	1951 Apparent Consumption Total	Mid-1952 Production[b] Continental Western Europe	Mid-1952 Production[b] Soviet Bloc	Mid-1952 Production[b] Total	Mid-1954 Production[b] Continental Western Europe	Mid-1954 Production[b] Soviet Bloc	Mid-1954 Production[b] Total
Aluminum	Thous. metric tons	321	221	542	295	205	500	365[a]	260	625	465	327	792
Copper	Thous. metric tons	101	272	373	663	300	963	101	277	378	123	325	448
Cobalt	Metric tons	15	950	965	1,300	950	2,250	100	1,000	1,100	600-900	1,500	2,100-2,400
Lead	Thous. metric tons	176	234	410	470	250	720	185	250	435	208	262	470
Molybdenum	Metric tons	150	1,450	1,600	2,000-2,500	3,100	5,100-5,600	150	1,550	1,700	200	1,100	1,300
Nickel	Metric tons	500	28,500	29,000	18,000	24,500	42,500	750	30,000	30,750	1,000	31,500	32,500
Steel (Crude)	Thous. metric tons	40,890	36,825	77,715	30,000-32,000	37,000-38,000	67,000-70,000	43,465	38,850	82,315	40,000	45,750	85,750
Tin	Metric tons	2,000	15,100	17,100	25,000-26,000	17,000-18,000	42,000-44,000	2,360	16,125	18,485	3,700	20,300	24,000
Tungsten	Metric tons	3,665	10,150	13,815	3,500-4,000	5,000-6,000	8,500-10,000	4,750	10,425	15,175	6,300[c]	11,900	18,200
Zinc	Thous. metric tons	302	225	527	480	300	780	310	253	563	340	279	619

a. Consumption at economic levels comparable to 1951.
b. All production represents metal content of mine production with the exception of steel and aluminum.
c. Possible maximum annual production which might be achieved.

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PRIMARY ALUMINUM

DISCUSSION AND CONCLUSIONS

Addition of continental Western European aluminum reduction capacity in mid-1952 would increase the Soviet bloc potential of 288,000 metric tons to 738,500 tons, or to about two and a half times the estimated capacity within the Soviet bloc in mid-1952. By 1954 the combined capacity could reach 793,000 tons.

Consumption of primary aluminum in continental Western Europe approximated production in 1950; production is reported or estimated as 223,100 metric tons while consumption was approximately 225,300 metric tons. Production in continental Western Europe is increasing significantly; 1951 production is estimated to be about 44 percent over that of 1950, or 321,500 metric tons. Further additions to capacity, plus modernization and concentration in the industry in some countries, are expected to increase capacity by mid-1954 to approximately 465,000 metric tons. If consumption in continental Western Europe were to continue at levels comparable to 1951 demands would be expected to total about 360,000 tons in 1954. Essential civilian consumption is not large and well over half the Western European total output could be diverted to military production. Some would undoubtedly be needed to substitute for other materials, particularly copper.

Estimated production in the Soviet bloc is 221,000 metric tons in 1951, or 16,000 tons more than estimated consumption. During the subsequent three years consumption is expected to increase at a much slower pace than production facilities would make possible with estimated consumption by 1954 reaching 260,000 tons compared with a potential production of 327,500 tons.

With capacity in the combined area estimated at 793,000 tons in 1954 and consumption estimated at 620,000 tons, the surplus of 173,000 tons could be used for increased military requirements or for substitution. Unless there is some technical difficulty or shortage of electricity, it is improbable that this capacity would be left idle in view of the tightness of other metals and the ready availability of raw materials for aluminum. Utilization of full aluminum reduction capacity at any given time would be related primarily to the availability of electric power, the requisite for aluminum production which is most likely to cause difficulty. Aluminum production in both Eastern and Western Europe is expected to increase slightly faster than electricity production. At the estimated rates, aluminum production will require approximately 4.0% of available electricity in 1951 in the combined areas and 4.4% by 1954. However, there is an important seasonal aspect to availability of electricity since the aluminum industry in Western Europe depends almost entirely on hydroelectricity, which in turn depends on weather conditions and the resulting flow of water. During times of acute shortage in the immediate past it has been the practice to divert electricity needed for the aluminum industry to other consumers. It may be, therefore, that in some areas aluminum production could be kept at capacity levels only at the expense of other important industrial users.

PRIMARY ALUMINUM

ESTIMATED PRODUCTION, PRODUCTION CAPACITY AND INVENTORY SOVIET BLOC AND WESTERN EUROPE

(Unit measure 000 metric tons)

Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Inventory End-1951	Inventory Mid-1952	Reduction Capacity[a] 1951	Reduction Capacity[a] Mid-1952	Annual production rate[b] Mid-1953	Annual production rate[b] Mid-1954
Grand Total	542.5	625.5	551.8	297.5	345.0	695.3	733.5	733.0	793.0
Western Europe:	321.5	365.5	339.8	40.0	50.0	450.5	450.5	435.5	465.5
Austria	30.0	35.0	44.2 (43)			59.0	59.0	40.0	65.0
France	83.0	88.0	63.9 (41)			100.0	100.0	100.0	105.0
Italy	45.0	47.0	48.2 (41)			57.0	57.0	57.0	57.0
Norway	50.0	52.0	27.8 (40)			64.0	64.0[c]	64.0	64.0
Spain	2.5	3.5	1.3 (40)			3.5	3.5	3.5	3.5
Sweden	7.0	7.0	3.7 (44)			7.0	7.0	11.0	11.0
Switzerland	24.0	30.0	28.3 (40)			35.0	35.0	35.0	35.0
West Germany	70.0	90.0	120.4[d] (42)			110.0	110.0	110.0	110.0
Yugoslavia	10.0	13.0	2.0 (42)			15.0	15.0	15.0[e]	15.0
Soviet Bloc:	221.0	260.0	212.0	257.5[f]	295.0	244.8	288.0	297.5	327.5
USSR	200.0	225.0	86.4 (45)	250.0	285.0	220.0	245.0	250.0	275.0
East Germany	3.0	15.0	90.9 (42)			4.8	18.0	25.0	27.5
Hungary	18.0	20.0	13.2 (44)	7.5	10.0	20.0	25.0	22.5	25.0
Communist China			8.6 (43)						
North Korea			12.9 (44)						

a. Capacity for Western Europe, except Yugoslavia, given by OEEC, calculated from maximum monthly output.
b. Assumes availability of electric power to allow full utilization of capacity.
c. Plan is for capacity of approximately 104,000 metric tons by 1955.
d. Germany's immediate prewar and wartime production was approximately 63% in Western Germany and 47% in Eastern Germany.
e. Additional capacity of 30,000 tons planned but probably will not be in operation for several more years.
f. Estimated accumulated postwar surpluses.

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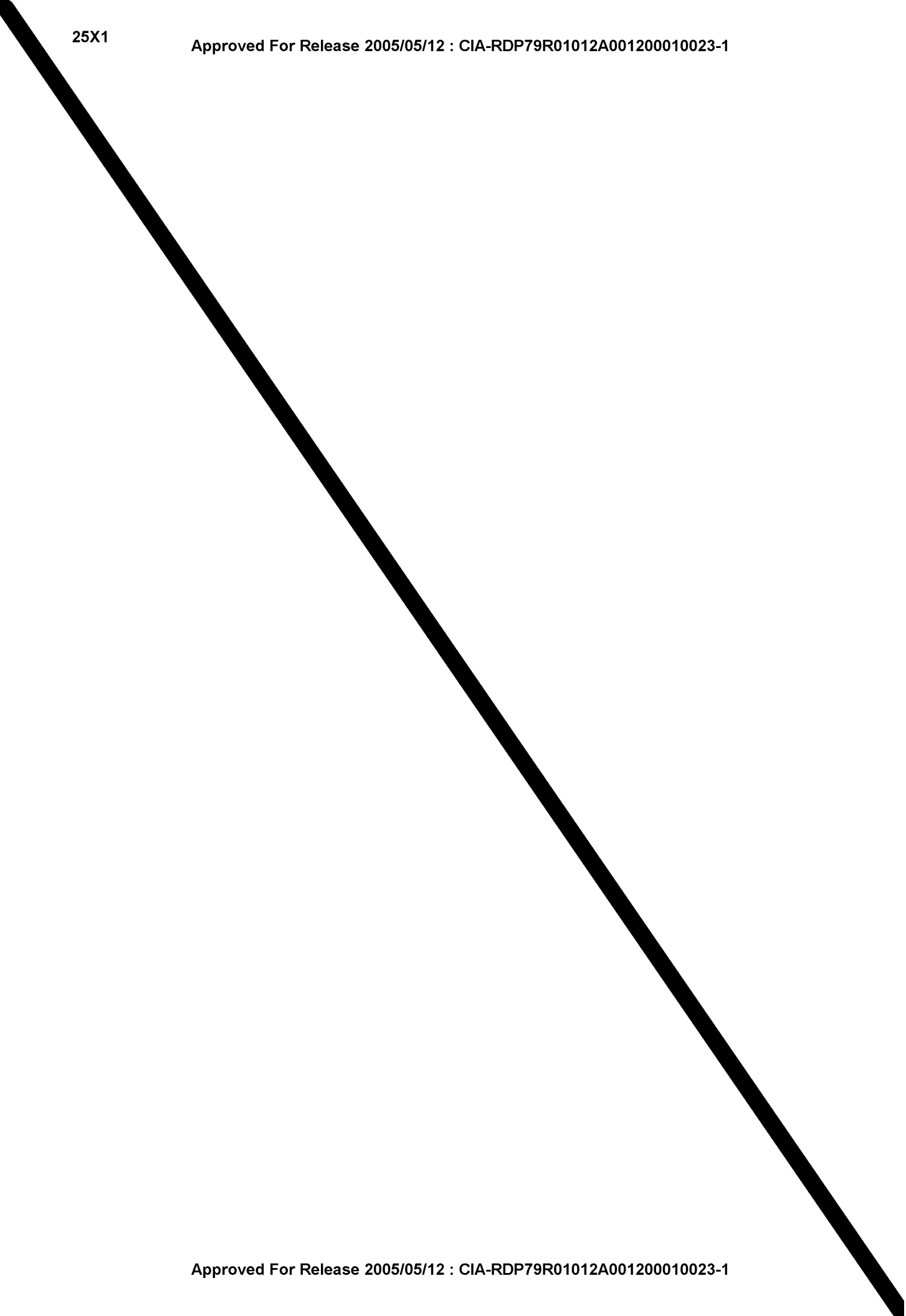

COPPER

DISCUSSION AND CONCLUSIONS

All Europe and particularly Western Europe has for years been a deficit area in copper and is expected to remain in this position for the foreseeable future.

Under the conditions outlined in NIE-40, Western Europe could probably produce a maximum of 100-125 thousand metric tons of primary copper per year from indigenous supplies in the period 1952-1954. Since Eastern Europe is also a net importer of copper, supplies from this source are unlikely. The supply estimate for Western Europe may be compared with primary consumption in 1949 of 540 thousand tons and in 1950 of 650 thousand tons. Dependence by Western Europe on indigenous production would require consumption to be about one-fifth of normal levels. Since a substantial recovery of secondary copper is customarily associated with primary consumption, total supplies of copper bearing materials would not be cut as severely. Extraordinary efforts to recover secondary from unusual sources--e.g. church bells, plumbing etc. would also alleviate the shortage somewhat. Taking these factors into account supplies might average somewhat more than one quarter of normal levels during the period 1952-1954. It is probable that Western European inventories existing in mid-1952 will be at such low levels as not to provide any significant cushion in the transition to these lower levels of consumption.

To determine the significance of such cuts, the relation between estimates of US essential civilian requirements and total consumption may serve as a useful benchmark. Based on US World War II experience, the DPA has estimated 1951 non-military essential requirements for primary and secondary copper at about 400 thousand tons, or about

thousand tons in mid-1952 is not expected to change the above calculations one way or the other.

The above conclusions are supported by examination of European wartime experience under German domination. Apparent consumption of primary copper by Germany in the period, 1940-44, has been estimated to average 90 thousand tons yearly.[1] This may be compared with total estimated Western European wartime supply of around 100 thousand tons. Another source reports that Germany consumed an average of 270 thousand tons yearly of primary and secondary copper in the period 1940-44 and that Germany was also able to add 189 thousand tons to stocks during this period. A substantial portion of these supplies must have come from scrap and the requisitioning of stocks from conquered countries. Germany was also able to call on the production of the Mansfeld mines in Eastern Germany amounting to about 24 thousand tons annually. Nevertheless, in view of the allied blockade of the European continent, German consumption at these levels plus additions to stocks implies that most of the primary production of Finland, Norway, Spain and Yugoslavia must have gone to Germany.

One might therefore conclude that if Germany was able to support a war economy in her own country, build up her own stocks and at the same time keep the economies of conquered countries functioning at a low level, then it should be possible to keep these same areas plus Germany functioning from approximately the same sources of supply on a somewhat higher than minimum civilian consumption basis. This is probably all the more true since the European economy would enter the period on a relatively firm physical basis, thanks to ECA. It should also be possible now in much greater degree than in World War II due to technical developments to substitute aluminum for copper to help meet the most urgent requirements.

PRIMARY COPPER

ESTIMATED PRODUCTION, SMELTER CAPACITY AND INVENTORY WESTERN EUROPE AND SOVIET BLOC

(Unit measure 000 metric tons)

Country	Smelter production 1951	Annual mine production rate			Inventory		Smelter production capacity		Annual mine production rate	
		1951	Mid-1952	Peak World War II	End-1951	Mid-1952	1951	Mid-1952	Mid-1953	Mid-1954
Grand Total	NA	373	379	NA	NA	NA	731	732	431	449
Western Europe:	236	101	101	110	minimum levels		378	378	113	123
Austria	5	3	3	1	"	"	7	7	3	3
Belgium[a]	-	-	-	-	"	"	80[b]	80[b]	-	-
Finland	22	22	22	16	"	"	30	30	25	30
Italy	2	2	2	3	"	"	2	2	2	2
Norway	9	12	12	16	"	"	9[b]	9[b]	12	12
Spain	7	7	7	13	"	"	25[b]	25[b]	10	10
Sweden	13	13	13	18	"	"	25	25	14	14
West Germany	138	2	2	NA	"	"	145	145	2	2
Yugoslavia	40	40	40	43	"	"	55	55	45	50
Soviet Bloc:	NA	272	278	NA	110	125	353	354	318	326
USSR	NA	250	250	NA	110	125	278[b]	278[b]	275	275
Poland[c]	NA	2	2	NA	none	none	3[b]	3[b]	10	15
Czechoslovakia[d]	NA	-	-	NA	"	"	2	2	-	-
East Germany[e]	NA	11	13	NA	"	"	55[b]	55[b]	17	20
Hungary	NA	-	1	NA	"	"	-	-	1	1
Rumania	NA	1	1	NA	"	"	3[b]	3	2	2
Bulgaria	NA	1	2	NA	"	"	3	3	3	3
Albania	NA	3	4	NA	"	"	3	4	4	4
Communist China[f]	NA	2	2	NA	"	"	3	3	3	3
North Korea	NA	2	3	NA	"	"	3	3	3	3

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a. Electrolytic copper production in 1950 was 124 thousand tons and refinery capacity is quoted at 125 thousand tons.
b. Quoted capacities; others estimated.
c. As a result of World War II, Poland has acquired an area in Lower Silesia in which there are three copper mines, the Lena, Konrad and Lubichow. Rehabilitation of these mines started in 1947 and in 1955 are expected to produce 25,000 tons of copper a year.
d. Copper production in Czechoslovakia is practically all from scrap. Mine production is from 55 to 75 tons a year.
e. The estimated total production of copper in East Germany for 1951 and 1952 is 35,500 tons and 38,000 tons respectively. The sources of copper other than mine production are scrap, contract and possibly imported ores.
f. For the years 1942-43-44, the production from what is now Communist China averaged roughly 2,600 tons a year, which consists of 2,000 tons from Manchuria and 600 tons from other parts of the mainland, principally from Yunnan and Sikang. There is no record of any production from Inner Mongolia. There was one mine in Jehol taken over by the Japanese and the production was probably included with Manchuria.

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is from scrap, estimated to be from 9 to 10 thousand tons a year. The total copper produced from scrap in the Soviet Bloc is estimated to be between 60 to 70 thousand tons a year.

The figures quoted in the tabulation were arrived at after extensive search of information available of past and present performance, and planned operations of the various 2 to 5 and 6 Year Plans, and are believed to represent within reasonable limits (plus or minus 10%) the production from ores for 1951 and the rate of production at mid-1952.

2. Inventory

Estimated inventory is of stockpiles and does not include normal working inventories.

In the case of Czechoslovakia we do not have any information on Government stock piles as such, but we do have information on stocks for industrial use as of December 31, 1949. A figure of 26,260 tons is considered reliable. It is believed that these stocks have been depleted.

With the world situation as it is, and has been, for the past few years it is unreasonable to believe that the USSR has not been stockpiling copper.

The estimate in the table is based on the following assumptions:

1. That prisoners of war estimates are accepted which were reported as being 30,000 tons copper in 1949.
2. That there has been a certain percentage of the yearly metal production shipped to stockpile. This percentage has been estimated at 10 to 15 percent for copper.

3. Production Capacity

Production capacity, as used in the tabulation represents the total rated primary smelter capacity to produce metal from ores.

The two important copper producing countries in the Soviet Bloc are Russia and East Germany. These countries also have the largest primary smelting capacity of the countries within the Bloc, estimated to be 95 percent of the total, Russia having seventy-nine percent of the total and East Germany about sixteen percent.

The primary smelting capacity of the USSR was estimated by using the estimated capacity of individual smelters from various sources and increasing the figures where information indicated expansion at a particular smelter, and eliminating capacity figures where information indicated that no smelter had been built.

In addition to the primary smelting capacity there is a smelter in Moscow which processes copper scrap to blister copper which is subsequently refined in an electrolytic copper refinery in Moscow. The capacity of this smelter is estimated to be 30,000 tons a year, and the capacity of the electrolytic copper refinery is estimated to be 30,000 tons a year.

The total electrolytic refining capacity in the USSR is estimated to be 160,000 tons.

The primary smelting capacity in the other Bloc countries is so small that a detailed explanation of each country is not warranted. In the case of Poland, however, they plan to have a smelting capacity of about 25,000 tons a year by 1955, which will process ores from mines that were taken over from Germany after World War II.

4. Estimated Annual Production Rates Mid-1953, Mid-1954

USSR: The Mid-1953 and Mid-1954 estimated production rates are based on the assumption that the Russian Ministry of Non-Ferrous Metallurgy will make every effort possible to operate the existing plants up to capacity. As far as is known the labor supply is no

problem, however, the quality may not be so good, with part of the labor paid and the other forced. There are adequate resources to supply the raw materials provided development work is kept up at least even with ore extraction.

The principal things that could interfere with maximum production are the negligence of the mine administration, and an inadequate supply of repair parts. This condition according to the Soviet press existed at the largest open pit mine in the USSR during January and February of 1951 and the Mine Administration was criticized for their negligence.

Poland: Copper production in Poland is expected to increase in Mid-1953 and Mid-1954 and by 1955 it is planned to have a production of 25,000 tons a year from the former German-owned mines. The smelting capacity will also be increased to take care of the production from the mines and mills that are now supposed to be under construction.

It is believed that every effort will be made to bring these mines into full production as soon as possible and that by Mid-52 and Mid-54 production will be at the rate estimated.

The ore reserves are reported to be large and the Poles have the technical know how and labor to do the job. However, reports indicate some labor unrest in Poland and this very well could upset their plans.

East Germany: There is one large copper producing area in East Germany, the Mansfeld area. In this area is the old Mansfeld mine which from 1927 to 1937 produced an average of roughly 26,000 tons of copper a year. The ore reserves of this mine have been depleted both in metal content of the ore and tonnage. Production from this mine is expected to decline from about 9,000 tons in 1950 to about 7,000 tons by 1954. Another mine in the same area and just coming into production (1951) is the Sangerhausen mine which is expected to replace the declining production of the Mansfeld mine.

The Sangerhausen mine was slated to come into production the last half of 1951 at the rate of 4,000 tons of copper a year and gradually increase production to 10,000 tons a year. The ore is to be transported to the Mansfeld plants by an aerial tramway and to be processed at Mansfeld.

The ore reserve at Sangerhausen is reported to contain 340,000 tons of copper which it is estimated will yield about 270,000 tons of recoverable copper. At the planned rate of production (10,000 tons a year) this would indicate a life of 27 years. However, with the Russians in control they may force production even higher than 10,000 tons a year.

The estimate is based on the following production rates:

	1953	1954
Mansfeld	8,000	7,000
Sangerhausen	9,000	13,000
	17,000	20,000

There are three things that could cause less production than estimated:

1. The lack of technically trained men and skilled miners.
2. There is an apparent shortage of repair parts and materials which formerly came from the Ruhr.
3. In forcing the mine for greater output the ore may become diluted with waste material thereby lowering the metal content of ore mined and in addition the mine could be very easily ruined by caving ground.

Other Bloc Countries: The production from the rest of the Bloc Countries is limited by the lack of ore reserves and production facilities.

COBALT

I. CONCLUSION

Cobalt is a specialty metal important in the production of certain types of military equipment. Under the assumptions there will be a critical shortage of cobalt in Western Europe by mid-1952. The USSR at that time will be able to meet domestic requirements but not Western European and satellite requirements. Where possible, other metals will be substituted for scarce cobalt especially in Western Europe. The situation will gradually improve during 1953 and 1954 through increased production in the USSR and Finland, reactivation of indigenous production by former producers in Western Europe and cobalt concentrate exports from the USSR to Western Europe.

II. DISCUSSION

It is estimated that by mid-1952 apparent consumption of cobalt in Western Europe and the present Soviet bloc will be at annual rates of 1300 metric tons and 1000 metric tons respectively or a total of 2300 tons. Indigenous production of cobalt by mid-1952 is estimated at 100 tons in Western Europe and 1000 tons in the USSR or a total of 1100 tons. Therefore should Western European access to foreign supplies be cut off in mid-1952 there would be a cobalt shortage in the entire area with the main impact upon Western Europe.

There is at present no significant production of cobalt from indigenous ores in Western Europe - all refining and smelting being from foreign ores and concentrates. Contingent upon the entry into production in Finland by 1952 of a new process involving the extraction of cobalt from roasting residues, and to a lesser extent upon the resumption of indigenous production by former producers, Western European production of indigenous cobalt may attain annual production rates of 400-460 tons by mid-1953 and 600-700 tons by mid-1954. Production by mid-1952 is only estimated at 100 tons. In the USSR current production of 950 tons is reported as sufficient to meet domestic requirements plus a small amount for stockpiling but not sufficient to meet satellite requirements. Annual production by mid-1952 is estimated at 1000 tons and is expected to reach 1500 tons by mid-1954. Production for the entire area by mid-1954 is estimated at 2100-2400 tons.

The assumption may be made that the bulk of cobalt available after mid-1952 would be assigned to military production since essential civilian requirements are negligible. However, if productive capacity in Western Europe is fully utilized to support

the Soviet war effort, it is doubtful whether indigenous cobalt production there could meet military production requirements during the period under consideration. It is estimated that annual consumption of scarce cobalt in wartime Axis Europe exceeded 800 tons. Cobalt is now more widely used in military production than in World War II and the larger part of current cobalt availabilities in Western Europe is going into defense production. Therefore cobalt requirements in Western Europe after mid-1952 will probably exceed World War II consumption levels by a considerable margin.

On the basis of present and future production estimates the USSR could not supply Western Europe with significant quantities of cobalt metal and still meet domestic requirements. It is possible however that nickel-cobalt ore production in the USSR could be increased so as to allow some nickel-cobalt concentrate to be shipped to Western European smelters and refineries for processing.

Under the present international allocation system no significant stockpiles of cobalt in Western Europe are anticipated by mid-1952. Therefore the resumption of military production in Western Europe under the Soviets would immediately introduce a cobalt problem. In the event that production goals which have been set for cobalt production in Finland should be attained, the cobalt supply situation in Western Europe would be considerably improved by mid-1954 when it is estimated that 600-900 tons will be produced annually. During the interim other metals would be substituted for cobalt wherever possible.

Vanadium is reported to be the best substitute for cobalt in steel where high red-hardness is required. Vanadium exports from the USSR and the resumption of vanadium production from iron ore slags in Germany could probably meet any increase in demand for

vanadium in Western Europe for purposes of cobalt substitution. Cemented carbide may be substituted for cobalt in high speed steels with a small loss in cutting speed and production rate. Nickel is indicated as a substitute binder in cemented carbide tools with some loss in efficiency. Various substitutes for cobalt are possible in the production of permanent magnets. Redesigning of magnet shapes in accordance with the magnetic properties of non-cobalt and low-cobalt materials could effect considerable conservation of cobalt. However, in some cases the use of other metals in lieu of cobalt is not satisfactory and substitution would be resorted to only under emergency conditions.

COBALT

ESTIMATED PRODUCTION AND PRODUCTION CAPACITY
SOVIET BLOC AND WESTERN EUROPE
(Unit measure: metric tons cobalt content)

Country	Production[a] 1951	Annual production rate Mid-1952	Peak annual production World War II	Smelting & Refining Capacity[b] 1951	Smelting & Refining Capacity[b] Mid-1952	Annual production rate[a] Mid-1953	Annual production rate[a] Mid-1954
Grand Total	965	1,100	650	5,400	5,800	1,700-1,750	2,100-2,400
Western Europe:	15	100	200	4,200	4,500	400-460	600-900
Belgium	c	c	c	3,000[d]	3,000[d]	c	c
Finland	15[e]	100[f]	98[h]	15[e]	100[f]	400	600-800
France	c	c	c	600[g]	600[g]	c	c
Italy	Neg.	Neg.	89[h]	NA	NA	50	90
Norway	-	c	c	-	200-300[i]	c	c
Sweden	-	-	9.3[h]	NA	NA	10	15
West Germany	-	-	j	500[k]	500[k]	-	-
Soviet Bloc:	950	1,000	450	1,200	1,300	1,300	1,500
USSR	950	1,000	450	1,200	1,300	1,300	1,500

a. From indigenous ores
b. Based on peak production of cobalt from imported ores and/or peak imports of cobalt ores.
c. All production from imported ores.
d. Based on reported capacity at Hoboken Oolen plant.
e. Based on pilot plant production of 12.5 tons during 1950.
f. Commercial production by new process scheduled to begin in 1952.
g. Based on cobalt content of estimated ore imports during 1951. France now has industrial facilities to process Moroccan cobalt ore.
h. Production peaks reached in World War II: Finnish peak production 1942. Swedish peak production 1945, Italy's peak production 1940.
i. Cobalt production as a by-product of imported Canadian copper and nickel ores scheduled to begin in 1952.
j. Production discontinued after World War II. Greatest production was in E. Germany (about 100 m.t. annually)
k. Based on estimated production during 4th qtr. 1951.

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SECRET

LEAD

DISCUSSION AND CONCLUSIONS

An examination of the lead industry of Western Europe and the Soviet bloc shows, as for the zinc industry, a substantial excess of metal production capacity. Mine production in the combined area in 1952-53 is estimated at about 440,000 tons. Primary metal production is estimated at over 900,000 tons. Most of the excess capacity is in Western Europe, which currently produces about 45 percent of its primary metal from imported concentrates.

Lead, Primary
(000 metric tons)

	Mid-1952 (Estimated)		
	Mine production	Metal production capacity	Consumption
Western Europe	250	670	470
Soviet bloc	190	230	250
	440	900	720

Consumption in the combined area is difficult to estimate. The current consumption requirement of the Soviet bloc is probably considerably above metal production of about 175,000 tons per year. Western European consumption in 1951 and 1952, owing to increased production for defense, is expected to total about 470,000 tons annually, even though conservation measures are adopted.

Available data on nonferrous metal consumption of Germany and the occupied countries during World War II indicates that essential civilian consumption of lead in Western Europe, were it to be taken over by the Soviets in mid-1952, could be maintained at least for a year or two by secondary sources of supply. Such primary metal production as could be maintained on Western European ores--probably about 250,000 tons annually--would be used to supplement Soviet supplies, either for military production in Western Europe or in the USSR and satellite countries.

SECRET

LEAD

ESTIMATED PRODUCTION, PRODUCTION CAPACITY, AND INVENTORY
SOVIET BLOC AND WESTERN EUROPE[a]

(Unit measure: 000 metric tons)

Country	Primary Metal Production 1951	Mine Production 1951[b]	Annual mine production rate mid-1952[b]	Peak annual mine production World War II	Primary metal production capacity 1951	Primary metal production capacity Mid-1952	Annual mine production rate Mid-1953[b]	Annual mine production rate Mid-1954[b]
Grand Total	607	410	435		909	909	460	470
Western Europe:	431	234	250		677	677	262	262
Austria	9	5	5	NA	12	12	5	5
Belgium	52				126[c]	126[c]		
Finland		*	*	1 (43)			*	*
France	53	10	12	6 (42)	109[c]	109[c]	13	13
Italy	53	38	40	44 (44)	66	66	42	42
Netherlands	6				6	6		
Norway				*				
Portugal		1	1	*			1	1
Spain	35	38	40	42 (41)	50[d]	50[d]	40	40
Sweden	16	22	25	20 (45)			28	28
West Germany	130	50	57	NA	218[c]	218[c]	63	63
Yugoslavia	77	70	70	30 (41)	90[c]	90[c]	70	70
Soviet Bloc:	176[g]	176	185		232	232	198	208
USSR	100	100	100	88	120[d]	120[d]	110	115
Poland	20	20	25	NA	55[e]	55[e]	25	30
Czechoslovakia[h]	3	3	4	NA	4[d]	4[d]	4	4
East Germany	20	20	20	NA	21[d]	21[d]	20	20
Hungary	*	*	*	NA	NA	NA	*	*
Rumania	4	4	5	NA	8[e]	8[e]	6	6
Bulgaria	11	11	12	NA			13[f]	13[f]

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Country	Primary Metal Production 1951	Mine Production 1951[b]	Annual mine production rate mid-1952[b]	Peak annual mine production World War II	Primary metal production capacity 1951	Primary metal production capacity Mid-1952	Annual mine production rate Mid-1953[b]	Annual mine production rate Mid-1954[b]
Albania				NA				
Communist China[i]	6	6	7	NA	12[d]	12[d]	7	8
North Korea	12	12	12	NA	12[e]	12[e]	12	12

* Less than 500 tons.

a. No appreciable inventories are believed to exist, except in the USSR. The inventory in the USSR at the end of 1951 is estimated at 65,000 tons; and in mid-1952, at 75,000 tons.
b. Recoverable basis.
c. Theoretical capacity; may be considerably above actual capacity.
d. Estimated capacity.
e. Rated capacity.
f. Bulgaria is erecting a smelter expected to produce 13,300 tons of metal annually by 1953.
g. Metal production is estimated to equal the recoverable content of mine production.
h. Czechoslovakia also produces about 3,000 tons of lead annually from scrap.
i. Includes estimate for Inner Mongolia.

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MOLYBDENUM

DISCUSSION AND CONCLUSIONS

Molybdenum will be particularly short on the European continent. This deficit could be met to a great degree by substituting tungsten, which for many uses is superior to molybdenum.

Continental Western Europe's consumption of molybdenum totaled about 1,700 metric tons in 1950. Estimated consumption for 1951 is 2,000-2,500 tons. Production in the area is insignificant. Under economic conditions comparable to those of the present time, a shortage of over 2,000 tons would exist since estimated stocks are small.

Production of molybdenum in USSR plus receipts from China do not meet USSR requirements and there is a shortage in the satellite countries, but additional quantities of tungsten would alleviate this situation. The available molybdenum should be sufficient to meet the small non-substitutable requirements, e.g., in electronic tubes, in both continental Western Europe and the Soviet bloc.

The greatest opportunities to obtain additional quantities of molybdenum are (1) further increase in molybdenum mining in Manchuria; (2) increased production from tungsten-molybdenum ores in China; (3) development of a process to obtain molybdenum from molybdenum copper-bearing ores in USSR; and (4) exploitation of low-grade reserves in Yugoslavia.

MOLYBDENUM

ESTIMATED PRODUCTION, PRODUCTION CAPACITY, AND INVENTORY SOVIET BLOC AND WESTERN EUROPE

(Unit measure: metric tons molybdenum content)

Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Inventory[a] End-1951	Inventory[a] Mid-1952	Annual production rate Mid-1953	Annual production rate Mid-1954
Grand Total	1,600	1,700	1,610	335	350	1,250	1,400
Western Europe:	150	150	580	335	350	200	300
Austria	-	-	7 (44)	8	10	-	-
Finland	-	-	148 (41)	-	-	-	-
France	-	-	11 (43)	90	95	-	-
Italy	-	-	26 (41)	14	15	-	-
Norway	150	150	368 (42)	-	-	200	300
Sweden	-	--	20 (44)	200	200	-	-
Switzerland	-	-	- -	19	20	-	-
Other countries	-	-	- -	4	10	-	-
Soviet Bloc:	1,450	1,550	1,030	-	-	1,050	1,100
USSR	900	1,000	450	-	-	1,050	1,100
Communist China	450	450	450	-	-	No estimate	
North Korea	NA	NA	30	-	-	No estimate	
Inner Mongolia	100	100	100	-	-	No estimate	

a. Based on reports to International Materials Conference.

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MOLYBDENUM

NOTES ON STATISTICAL DATA

1. Mine Production

Western Europe: Production in Western Europe is limited to Norway unless the low-grade ores in Yugoslavia can be exploited.

Soviet Bloc: About one-half Soviet requirements are taken care of by USSR production. Smaller quantities are realized from China and Inner Mongolia, and possibly from Northern Korea. A potential source of molybdenum in USSR is the reserve of molybdenum-bearing copper ores there, but technical development of the separation of the molybdenum from the ore has not been completed, and it is doubtful if any substantial production will be realized from this source for a number of years.

Production estimates for Communist China and Inner Mongolia in 1951 and 1952 are based upon wartime high level production. It is impossible to predict any rate of production for 1953 or 1954; but if the report that the Manchurian mines are now under the management of the Soviets is true, it might be assumed that by mid-1954 the wartime high will be surpassed. Possibilities for expanded production include (1) further increase in molybdenum mining in Manchuria and (2) increased production from tungsten-molybdenum ores in China.

2. Inventory

Inventories for Western Europe are based upon data submitted to the International Materials Conference concerning stocks as of September 30, 1951. The USSR is probably building a stockpile of molybdenum due to its strategic importance but present inventories are estimated as insignificant.

NICKEL

DISCUSSION AND CONCLUSIONS

Western Europe does not mine enough nickel ore to meet even minimum requirements. Indigenous production under intensified efforts might rise to 1,000 metric tons but minimum requirements are estimated at approximately 1,500 tons; direct military requirements would be much higher. Average consumption in 1948, 1949 and 1950 approximated 15,500 metric tons.

The Soviet bloc is self-sufficient in nickel production, mainly from USSR output which is now produced in excess of that country's requirements by 7-10,000 metric tons. Requirements of the satellite countries amount to about 2,000 tons. This would leave 5-8,000 tons available from current production for Western Europe, an amount which would more than meet essential civilian demand, but would not support usage at the present rate. Accumulated stocks in the Soviet bloc would alleviate any real shortage for several years.

Excess refinery capacity, amounting to 20-22,600 tons annually, would be available in Western Europe since these refineries now depend upon imported ore, mainly from Canada and New Caledonia. Some of this capacity would probably be used advantageously to refine USSR ore since refineries in that country likely cannot achieve optimum production due to obsolescent equipment. Ore reserves there are sufficient to permit some increased production, but the extent to which this might be accomplished would depend upon a number of factors, including assignment of manpower to nickel mining, availability of additional mining equipment and transport to refineries.

Manganese can be substituted for nickel in some alloys, since there will necessarily be a reduction in over-all usage of nickel. On the other hand, small quantities of nickel will be used as a substitute for cobalt.

NICKEL

ESTIMATED PRODUCTION, PRODUCTION CAPACITY, AND INVENTORY
SOVIET BLOC AND WESTERN EUROPE

(Unit measure metric tons metal content)

Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Inventory End-1951	Inventory Mid-1952	Refinery Capacity 1951	Refinery Capacity Mid-1952	Annual production rate Mid-1953	Annual production rate Mid-1954
Grand Total	29,000	30,750	23,576	22,000	32,000	53,600	57,600	32,400	32,500
Western Europe:	500	750	10,076	Neg.	Neg.	20,600	22,600	900	1,000
Finland	500	750	8,970(43)[a]			600	600	900	1,000
France	-	-	-			6,000	6,000	-	-
Norway	-	-	1,106(39)			11,000	13,000	-	-
West Germany	-	-	-			3,000	3,000	-	-
Soviet Bloc:	28,500	30,000	13,500	22,000	32,000	33,000	35,000	31,500	31,500
USSR	28,500	30,000	13,500(45)[a]	22,000	32,000	33,000	35,000	31,500	31,500

a. Change of boundary in 1944 transferred large nickel-yielding mines from Finland to USSR.

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NICKEL

NOTES ON STATISTICAL DATA

1. Mine Production

Western Europe: Indigenous production has been negligible in the recent past due to (1) exhaustion of Norwegian reserves and (2) transfer of nickel-bearing area at Petsame from Finland to USSR in 1944.

Soviet Bloc: Mine production in the USSR has increased in recent years and smelter and refinery capacity was expanded in 1950.

2. Inventory

Inventories of nickel in Western Europe are estimated as negligible. USSR production permits accumulation of stocks at the rate of 7,000 tons or more a year.

CRUDE STEEL

DISCUSSION AND CONCLUSIONS

Steel production in Western Europe in 1951 will be approximately 40,890,000 tons and in Eastern Europe is estimated at 36,825,000 tons, making a total of 77,715,000 tons. The combined rate of Western Europe and the Soviet bloc is expected to increase to 82,315,000 metric tons by mid-1952 and by mid-1953 and mid-1954 to 82,350,000 and 85,750,000 tons respectively. These supplies at first appear ample to sustain civilian requirements for both Eastern and Western Europe and a substantial contribution to Soviet military production as well. The level of combined civilian and military production which these quantities of steel could support may be judged by comparing these estimates with the average US annual steel output during 1942-1944 of 80,000,000 tons. However, due to certain bottlenecks discussed below, the contribution of the Western European steel industry to Soviet war potential would be less substantial than the annual rate of crude production indicates. Nevertheless, the general shortage in the Soviet sphere of steel products for essential civilian uses would make the utilization of Western European supplies of almost any grade or type likely.

The upward trend in Western European steel production through mid-1952 is apparent in all but a few countries. Factors which are likely to cause the present rate of steel production to increase are the requirements of steel for the current defense program and increased demand which is expected to result from the liberalization of trade promoted by the European Payments Union.

Western European crude steel production rate for mid-1953 and mid-1954 is projected at 40 million tons. There should be sufficient supplies of coke and manganese---assuming the allocation of Eastern

European coke and manganese to Western mills. The annual capacity of 49 million tons would not be reached due to shortages of iron ore, scrap problems, and obsolete equipment. Furthermore, there would be problems arising from the varying grades of crude steel and limited capacity for rolling the specialized types of products needed for military end products.

Although Sweden will be capable of producing for export 17 million tons of high-grade ore by mid-1953 and mid-1954, only 9 million tons would be available for use in either Eastern or Western European furnaces because this is the maximum amount that can be moved through Baltic ports. The coastal blockade would prevent the movement of Norwegian and Swedish iron ore from the port of Narvik. The Italian steel production is likely to be low inasmuch as Italy depends on North African ore which would also be blockaded. If Italy should produce at an appreciable rate, ore would have to be diverted from other Western European countries, thus introducing an ore transportation problem. Total ore availabilities of Western Europe would be about 80 million tons of which only the Swedish is of high-grade (61 percent). The remaining 71 million tons of ore would average only about 33 percent iron content. About 3 million tons of the high grade Swedish ore would be shipped to Eastern Europe.

Inasmuch as the ore supply available for consumption by the Western European steel industry plus circulating scrap would yield only about 34 million tons of metal, 15 million tons of scrap would have to be collected to enable Western Europe to produce at a capacity rate. Due to difficulties of collecting, sorting and transporting scrap, it is unlikely that Western Europe would be able to obtain more than 6 million tons annually for consumption. It is possible that even this quantity could not be collected and that steel production would then be less than 40 million tons.

Another bottleneck in the Western European steel industry is the relatively old equipment, particularly in Germany, Austria, France and Belgium. Much of the German equipment is 30 years old or older and Belgian steel output has never exceeded the 1929 rate. Without new equipment large segments of the industry might breakdown.

Although Western Europe would be able to produce 40 million tons of steel, 50 percent of the capacity is Bessemer steel which is not easily adaptable for direct military use. This type of steel is not entirely satisfactory in making first class ordinance and munitions, for example high-velocity shells. The contribution to a war effort of Bessemer steel is only indirect--for example it could be used for structures. Thus only 24.5 million tons of the estimated crude capacity (49 million tons) can be considered valuable for direct military use--19.6 million tons open-hearth steel capacity and 4.9 million tons electric steel capacity.

Another limiting factor is the capacity for rolling required military products. Among the steel products used to meet direct military requirements are plates, heavy sections and forgings. Based on the highest production achieved in one month only from April 1950-July 1951 it is estimated that Western Europe will be able to produce 4.5 to 5 million metric tons of plates, 3 million tons of heavy sections and 1 million tons of heavy forgings. However, only a relatively small portion of the plate capacity can be used for armor plate. In addition to these products, there are others which contribute to a direct military effort, but data are not now available on which to base production capabilities.

Eastern European annual rate of production is expected to increase from 1951 to mid-1954 by about 8,900,000 tons. This increase will come primarily from a small amount of new construction and some modernization and improvement in technology in the USSR. Raw materials supplies are a particular problem in the satellites.

SECRET

CRUDE STEEL

ESTIMATED PRODUCTION AND PRODUCTION CAPACITY SOVIET BLOC AND WESTERN EUROPE

(Unit measure 000 metric tons)

Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Production capacity 1951	Production capacity Mid-1952	Production capacity Mid-1953 Mid-1954	Annual production rate Mid-1953	Annual production rate Mid-1954
Grand Total	77,715	82,315	55,530	89,435	95,105		82,350	85,750
Western Europe:	40,890	43,465	38,400	43,135	46,605	49,005	40,000	40,000
Austria	990	1,100	1,001	1,130	1,300	1,300		
Belgium	4,800	5,000	1,894	5,000	5,000	5,000		
Denmark	150	150	Neg.	165	165	165		
Finland	130	140	90	140	140	140		
France	9,700	11,000	5,127	10,230	12,500	12,500		
Italy	2,700	2,800	2,236	2,880	3,000	3,100		
Luxembourg	2,900	3,000	2,151	3,000	3,000	3,000		
Netherlands	520	700	190	550	820	820		
Norway	70	90	Neg.	80	150	150		
Saar	2,500	2,500	2,926	2,550	2,550	2,600		
Spain	800	900	699	920	1,000	1,200		
Sweden	1,500	1,800	1,228	1,780	2,000	2,050		
Switzerland	130	130	Neg.	150	150	150		
Trieste	50	55	NA	70	70	70		
Western Germany	13,500	13,500	20,808[a]	14,000	14,000	16,000		
Yugoslavia	450	600	50	490	760	760		
Soviet Bloc:	36,825	38,850	17,130	46,300	48,500		42,350	45,750
USSR	29,000	30,500	9,900	36,250	38,125		33,000	35,500
Poland	2,300	2,400	2,440	2,900	2,900		2,750	3,000
Czechoslovakia	2,700	2,800	2,542	3,200	3,300		2,900	3,000

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Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Production capacity 1951	Production capacity Mid-1952	Production capacity Mid-1953 Mid-1954	Annual production rate Mid-1953	Annual production rate Mid-1954
Germany, East	1,200	1,400	NA	1,800	1,900		1,800	2,200
Hungary	800	825	784	900	925		850	875
Rumania	275	275	324	500	500		300	325
Communist China	550	650	1,000	750	850		750	850
North Korea	-	-	140	-	-		Cannot be estimated	

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CRUDE STEEL

NOTES ON STATISTICAL DATA

1. Mine Production

Western Europe: Western European crude steel production in 1951 is based on the annual rate of output during the first 3 or 4 months of year. By mid-1952 the annual production rate is expected to be 43,465,000 tons or 6 percent greater than 1951 output based on country plans, 1951 production, and capacity estimates for 1951 and 1952. The 1951 and mid-1952 production rates are lower than estimated capacity primarily due to current difficulties in transporting raw materials--particularly coal from the US.

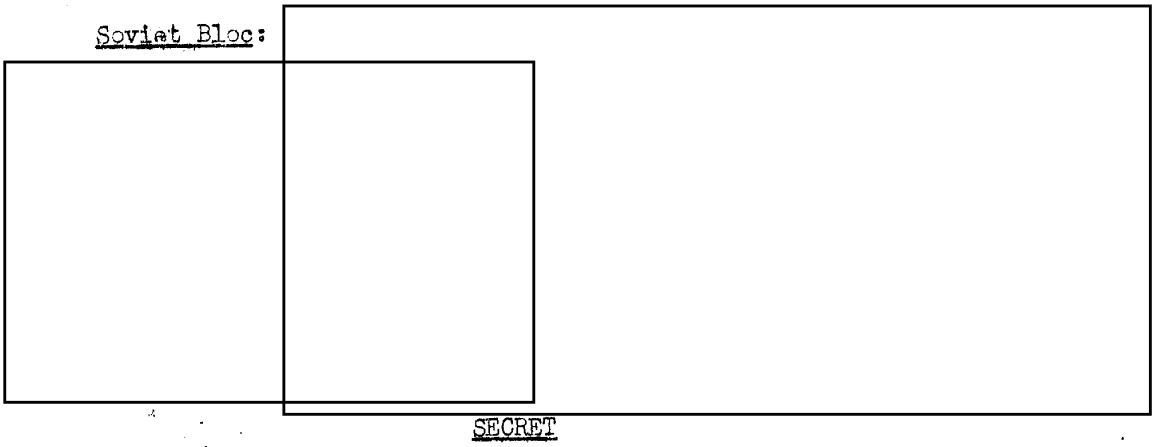
Western European crude steel production rate for mid-1953 and mid-1954 is projected at 40 million metric tons. The annual capacity of 49 million tons would not be reached due to iron ore shortages, scrap problems and obsolete equipment.

The ore supply available for consumption by Western European steel industry, plus circulating scrap would yield only about 34 million tons of metal. Due to difficulties in collecting, sorting and transporting scrap, it is unlikely Western Europe would be able to obtain more than 6 million tons annually for consumption. Part of the equipment in Western Europe, particularly in Germany, Austria, Belgium and France, is relatively old. Without new equipment large segments of the industry might breakdown.

25X1

Soviet Bloc:

25X1



USSR: In the postwar period, 1947-1950, the USSR realized an average rate of increase of approximately 4 million tons of raw steel. This remarkable recovery resulted primarily from the reconstruction of war-damaged installations, rather than from construction of new plants. Other contributing factors included the installation in Soviet mills of steel-making equipment removed from plants in countries overrun by the Soviet Army, the lavish use of scrap metal in open-hearth furnaces, and the assistance received from German experts in the supervision of installations and the repair of damaged facilities. Intelligence indicates that the bulk of reconstruction was completed by the end of 1950. The construction of several new iron and steel plants, undertaken in the post-war years, has fallen behind planned schedules, and it is estimated that little increase in production will be realized from these new sources of steel before 1955. As a result of the extravagant use of iron and steel scrap in the recovery period and the general world shortage of that vital raw material, the USSR is faced with a serious scrap shortage, particularly that of a high quality, which will be reflected in raw steel output. The annual rate of increase in raw steel production, therefore, will be at a lower level in the immediate future years, approximately 2.5 million tons. This increase will mainly result from: (1) a small amount from new construction; (2) increases from the modernization of and additions to existing installations; and (3) technological advancements in the industry and improved processing practices, such as mechanized straight line production methods and reduced melting times in the open-hearth furnaces. At present, it is estimated that the industry is operating at 80 percent of capacity, which is a theoretical figure based upon a study of the capacities of the equipment of the

individual plants. Under the most favorable operating conditions, it is not believed that the Soviets could achieve an output better than 90 percent of capacity.

Soviet Satellites: In the European Satellites, raw steel production has increased slowly during the postwar years, and, except for Poland, has fallen short of planned goals. No one of the satellites' iron and steel industries is founded on a firm raw material basis. Poland and Czechoslovakia have adequate reserves of metallurgical quality coking coal but lack high grade iron ores. Eastern Germany, Hungary and Rumania lack both suitable grades of coking coal and iron ore. As in the USSR, the procurement of iron and steel scrap is a major supply problem. Raw material supply problems, the physical conditions of plants and equipment and the general unrest of the workers made unrealistic the targets established by the various economic plans for the production of raw steel. To accomplish goals, the plans provided for: (1) the modernization and expansion of existing plant facilities, in which some progress has been realized in Poland and Czechoslovakia; (2) the construction of new mills, Poland, Czechoslovakia and Hungary have new combines in the initial stages of building; (3) the procurement of up-to-date installations and equipment, most important of which were ordered from the West and for which export licenses were denied in 1949 and which now have been promised by the Soviets; (4) the improvement of production methods and plant management, in which some progress has been realized; and (5) the procurement of adequate supplies of raw materials, which remains a problem. Under existing circumstances, actual production of raw steel in the European Satellites will continue to fall short of planned targets.

North Korea's iron and steel industry reached peak output during World War II under Japanese direction, and little damage resulted

from military operations, Air Intelligence reports that during present operations in Korea, all steel producing facilities were demolished completely by bombardment. Future capacity and production will depend entirely upon military and political developments in the area.

China produced approximately 1 million tons of raw steel during its peak year of World War II, the larger part of Manchurian installations and equipment were removed by the Russians, which practically immobilized the industry. An appreciable recovery has been made and in 1950, China produced approximately 500,000 tons of raw steel, 450,000 tons of which were produced in Manchuria. Current output is estimated to be almost the maximum which can be realized from existing equipment, much of which is old. To increase production new installations, equipment and machinery will have to be supplied by the USSR, existing equipment modernized and technical personnel trained.

As in the USSR, the output of the various plants in the satellites is estimated to be approximately 80 percent of capacity.

2. Inventory

Western Europe: Based on apparent consumption data, movements in stocks in both directions appear to have occurred in European countries during 1949, and towards the end of 1950 stocks seemed to be increasing fairly rapidly. However, there are no reliable data on actual inventories.

Soviet Bloc: Raw steel, as such, is not stockpiled either in the USSR or in the Satellites. In the USSR, stockpiling of end products made from raw steel, principally for military use, is underway by the direction of the Minister of State Reserves. An accumulation of a similar reserve, on a proportionately smaller

TIN

DISCUSSION AND CONCLUSIONS

Tin-bearing products are vitally important and widely used in an industrial or war economy, and therefore Russia could not wage a war without sufficient quantities of tin. Alloys of tin are needed in making and/or repairing parts of automotive equipment, aircraft, ships, submarines, tanks, electric motors and generators, machine tools, and radio, radar, telephone and telegraph equipment, etc. Bearings made of alloys containing tin are especially needed for modern industrial and war machines. In a war economy the amount of tin in these essential uses can be decreased somewhat, as the US did during World War II, but complete substitutes for most of them have not been developed.

Large quantities of tin are ordinarily used in making tinplate which is used primarily for food preservation. Although civilian use of tinplate could be almost completely cut off, some would be necessary to provide army rations but this amount could be cut to relatively small quantities.

Total primary tin production is estimated to be 63,700 metric tons during the 3-year period mid-1952 to mid-1955--57,600 tons in the Soviet bloc and 9,100 tons in Western Europe. By mid-1952 Western European smelter stocks are estimated to be 3,500 metric tons and Russian stocks 9,000 tons. The seriousness of a tin shortage can be measured by comparing the possible use of these available supplies in Europe with US tin consumption in essential industrial and war products during World War II when severe tin conservation restrictions were in force. Since the steel industry is a fairly good indicator of activity in the metal-working industries, tin consumption may be related directly to steel production. Based on

the US World War II ratio of primary and secondary tin consumption in bearing metal, solder and other alloys to steel production, it is estimated that the combined Eastern and Western European economy would have sufficient tin supplies to produce essential industrial and war materials for the 3-year period mid-1952 to mid-1955.

This conclusion is based on an optomistic primary tin supply of 76,200 metric tons (production and stocks) and assumes that a vigorous scrap collection program would be undertaken. Even under these optimum conditions the Soviets would be as hard pressed for tin as were the Germans during World War II. However, scrap collections would necessarily fall off after 3 years and since quantities which might be obtained by smuggling would be relatively small, only new production of 23-24,000 tons annually would be available. The Soviets would then definitely have a tin shortage after mid-1955, and the rate of industrial and war production might decrease.

TIN

ESTIMATED PRODUCTION, SMELTER CAPACITY, AND INVENTORY SOVIET BLOC AND WESTERN EUROPE

(Unit measure: metric tons metal content)

Country	Mine[a] production 1951	Annual[a] mine production rate Mid-1952	Peak mine[a] production World War II	Inventory End-1951	Inventory Mid-1952	Annual smelter capacity 1951 - Mid-1952	Annual mine production rate Mid-1953	Annual mine production rate Mid-1954
Grand Total	17,100	18,485	18,333	NA	12,500	80,200	21,200	24,000
Western Europe:	2,000	2,360	4,458	NA	3,500[b]	58,200	3,000	3,700
Belgium	-	-	-			18,000	-	-
France	100	460	-			1,200	700	800
West Germany	-	-	-			6,000	-	-
Italy	-	-	199			-	-	-
Netherlands	-	-	-			30,000	-	-
Portugal	1,200	1,200	3,100			1,500	1,500	2,000
Spain	700	700	1,159			1,500	800	900
Soviet Bloc:	15,100	66,125	13,875	8,500	9,000	22,000	18,200	20,300
USSR	9,000	10,000	5,000			12,000	11,000	12,000
East Germany	100	125	995[c]	NA	NA	NA	200	300
Communist China	6,000	6,000	7,880[d]	e	e	10,000	7,000	8,000

a. Includes content of the mixed concentrates.
b. Estimated smelter stocks.
c. Bureau of Mines estimate for 1943-mine production.
d. Pai, C.C. Geological Survey China, Special Report 7, Dec. 1945 - Production for 1942.
e. Surplus shipped to the USSR.

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TIN

NOTES ON STATISTICAL DATA

Western Europe

1. Production

Tin mine production during 1951 in western Europe is estimated to be about 2000 metric tons or 18 percent larger than 1950 output of 1690 metric tons. This increased output over 1950 production is accounted for by Spain and Portugal which countries are expected to achieve this level during 1952 because of an expected increase in mixed tin and wolfram concentrates and because of a possible tin price increase. By mid-1952 the annual rate of output is expected to increase to 2360, 18 percent greater than 1951 production. This latter increase is due to the French tin project financed by Marshall Plan credits. Production increases over those indicated are unlikely before 1953 inasmuch as tin is available in sufficient quantities from other more economical sources.

Although the Soviets have the Chinese supplies, they would be hard pressed for tin. Therefore, it is assumed that tin in Spain and Portugal would be produced at a maximum level. This level would not likely reach the peak world war II output because the veins containing tin ore are reportedly narrow and limited.

2. Inventory

No reliable data are available on inventories on strategic stockpiles. However, western European smelter stocks mid-1952 are projected at 3,500 tons based on the first half of 1951 average.

3. Production Capacity

The tin smelter capacity in western Europe is estimated to be 58,200 tons and is not likely to increase substantially inasmuch as capacity is far greater than available concentrates. The Hoboken

smelter in Belgium is reported by various sources to be only 10,000 tons instead of the 18,000 tons recorded in the table. Belgium's peak tin metal output was 12,250 metric tons in 1947, therefore the higher figure has been used. Capacity data for the numerous small smelters in Spain and Portugal are estimated from fragmentary reports and data for the other countries are reported capacities.

Soviet Bloc

1. Production

The principal tin producing countries within the Soviet Bloc are the USSR, China, and a small quantity in Eastern Germany. The other Satellite countries depend upon outside sources for their tin requirements.

USSR: The production of tin in the USSR has been estimated at 9,000 tons for 1951, although figures for 1950 estimated by various sources have ranged from 8,000 to 10,500 tons. Many tin-bearing deposits have been disclosed during the past fifteen years and some are believed to be fairly sizeable. Their exploitation, however, may be difficult or uneconomical and will require time to get the mines properly developed for full exploitation and to acquire the necessary equipment and transportation facilities. It is, therefore, believed that the rate of production will not increase much more than 1,000 tons per year or to 12,000 tons by mid-1954.

China: Tin production in China for 1951 is estimated at 6,000 tons which is somewhat higher than estimates for 1949 and 1950 given by the International Tin Study Group. For the near term this rate of production is not expected to increase owing to disturbed conditions in the Yunnan Province, the principal producing area, and the requirement of considerable capital investment to restore Chinese mine output to the prewar level. Assuming that some improvement in operating conditions is

possible together with the acquisition of necessary replacement equipment which will take time, it is estimated that the rate of production can be increased to 8,000 tons by Mid-1954.

2. Inventory

The inventory or stockpile of tin in the USSR is not known, but assuming that at the beginning of 1948 there was a stockpile of 3,000 tons and that ten percent of domestic production is set aside for stockpiling during the period following, or 3,500 tons by the end of 1951 and 4,000 tons by Mid-1952, this would bring it up to 6,500 and 7,000 respectively. It is also believed that some of the tin acquired from the satellite countries since 1948 has been for stockpiling, possibly 2,000 tons, which added to the above estimates would give a total of 8,500 and 9,000 tons by the end of 1951 and Mid-1952 respectively. As no definite information is available, the above estimates may be off by 25 percent or more.

China: Information covering stockpiles of tin in China is lacking, but it is believed, from information available, that most of the tin produced is shipped to the USSR and any surplus stocks of tin would not remain within the country for any length of time.

3. Production Capacity

USSR: The existence of several tin smelters in the USSR has been reported but information is lacking covering capacities of individual plants. The present smelting capacity, however, is believed to be sufficient to take care of present production of tin concentrates. Some of these reported smelters are located within certain areas and each smelter processes the ores or concentrates from several mines within its area. The total smelting capacity is estimated at 12,000 tons or somewhat higher than the estimated mine production.

China: Smelter production of tin has been estimated at 13,000 to 14,000 tons in 1940 which may be considered as the peak year and smelter capacity at that time. Smelter production dropped to about 2,000 tons in 1946 but has since increased. It will probably take some time to restore the smelting capacity to the prewar level owing to plant deterioration, so that present capacity is estimated at 10,000 tons or less.

TUNGSTEN

DISCUSSION AND CONCLUSIONS

The combined annual tungsten production rate of Western Europe and the Soviet bloc by mid-1952 is expected to be 15,175 metric tons or 10 percent greater than 1951 output of 13,815 tons. Of this only 4,750 tons can be expected from Western Europe. The expected inventories in Russia by mid-1952 of 10-15,000 tons together with projected increases in Western European and Soviet bloc annual production rates by mid-1953 and mid-1954 to 17,450 and 18,200 tons respectively appear sufficient to meet all European requirements indefinitely. In addition to meeting requirements for tungsten the projected supply would be great enough to meet the molybdenum deficit to a great extent by substitution. The sufficiency of these projected tungsten supplies can be measured by comparing them with total 1951 requirements of 18,600 metric tons for the US and Western Europe as estimated by the IMC, or with free world consumption of 11,200 tons in 1943 and 15,335 tons in 1950.

An upward trend in current tungsten production is apparent in all Western European producing countries except Sweden. This trend is likely to continue because of the defense program, the loss to the free world of Chinese tungsten, and the efforts of IMC to encourage increased output by urging producers and consumers to conclude long-term contracts. Currently the possible maximum tungsten output appears to be 6,300 metric tons metal content annually or 33 percent greater than the estimated mid-1952 annual rate of production. This rate could be reached as early as mid-1952 if satisfactory long-term contracts could be concluded in the next few months and if some additional financial assistance were given producers permitting better mechanization of mines. It is likely Russia would have to ship Chinese tungsten to Western Europe if war production were to be maintained in this area.

The USSR produces about one-half of its consumption requirements for tungsten. Production is supplemented by imports, principally from China and Inner Mongolia, and possibly from Northern Korea. USSR imports have been sizeable for a number of years and it is estimated the Soviets have been successful in stockpiling a supply for one or two years (5-10,000 tons). It is expected that by mid-1952 the USSR will have stocked a 2 or 3-year supply of tungsten (10-15,000 tons). Several new deposits of ore have been discovered, but reserves are small and any output realized from these new sources would be insignificant.

China produces about 70 percent of the world output of tungsten. With current methods and equipment China could produce over 14,000 tons of concentrates annually, and it is estimated that with modern technology and mechanical equipment China could produce 18,000 tons or more of concentrates a year. Except for a small quantity consumed by the Chinese steel industry, the tungsten output is shipped to the USSR as is the Inner Mongolian production.

Although Northern Korea has large tungsten reserves, future production will depend on the outcome of the current political situation. Except for a small amount of tungsten produced in Czechoslovakia, the European satellites are dependent upon imports primarily from the USSR for their requirements.

TUNGSTEN

ESTIMATED MINE PRODUCTION, AND INVENTORY
SOVIET BLOC AND WESTERN EUROPE

(Unit measure metric tons metal content)

Country	Mine production 1951	Annual mine production rate Mid-1952	Peak annual mine production World War II	Inventory End-1951	Inventory Mid-1952	Annual mine production rate Mid-1953	Annual mine production rate Mid-1954
Grand Total	13,815	15,175	15,635	NA	NA	17,450	18,200
Western Europe:	3,665	4,750	5,635	NA	NA	6,300	6,300
France	425	540	60			940	940
Portugal	2,000	2,900	3,558			3,500	3,500
Spain	1,040[a]	1,150	1,857			1,700	1,700
Sweden	200	160	160			160	160
Soviet Bloc:	10,150	10,425	10,000	NA	NA	11,150	11,900
USSR	2,575	2,850	1,500	5-10,000	10-15,000	3,100	3,350
Communist China	7,175	7,175	6,700	NA	NA	7,650	8,150
North Korea	NA	NA	1,400	-	-	NA	NA
Inner Mongolia	400	400	400	-	-	400	400

a. Approximately 800 tons reported and about 20 tons monthly smuggled.

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TUNGSTEN

NOTES ON STATISTICAL DATA

Western Europe

1. Production

Tungsten production estimates for 1951 and 1952 are based on surveys made by the International Materials Conference. These estimates for 1951 appear reasonably correct and are consistent with partial year reports on production. The estimated 1951 production of 3,665 metric tons metal content is 80 percent greater than 1950 output of 2,014 tons. For 1952 tungsten production is expected to be 4,750 metric tons metal content or 30 percent larger than 1951 output. This upward trend is apparent in all producing countries except Sweden. This trend is likely to continue because of the Defense Program, the loss to the free world of Chinese tungsten, and the efforts of IMC to encourage increased output by urging producers and consumers to conclude long-term contracts.

After 1951 maximum production in Sweden will decline because the Swedish wolframite deposit will be exhausted if no new ore bodies are found. There is a possibility that this deposit might still yield a small production, but not more than 40 tons a year. The Swedish scheelite deposit has fairly small veins so that increased output is not likely. The content of the ore is about 15-20 percent lower than during World War II, but the mine is still able to produce at the same rate due to rationalization and improvements in the concentrating plant.

2. Inventory

There are no reliable data on actual inventories. It is likely that consumer stocks are low and that strategic stockpiling has been negligible because the free world tungsten supply has been relatively short.

ZINC

DISCUSSION AND CONCLUSIONS

One striking aspect of the zinc industry of Western Europe and the Soviet bloc as a whole, under blockade conditions, is an excess of metal production capacity. Mine production in the combined area in 1952-1953 is estimated at about 600,000 tons, and primary metal production is estimated at over 1,000,000 tons. Most of the excess capacity is in Western Europe, which currently produces about 50 percent of its primary metal from imported concentrates. This excess capacity would be an asset to the Soviets, since production could be shifted to a certain extent if, for example, transport or other difficulties were to arise in a particular area.

Zinc, Primary
(000 metric tons)

	Mid-1952 (Estimated)		
	Mine production	Metal production capacity	Consumption
Western Europe	330	650	500
Soviet bloc	270	350	300
Total	600	1,000	800

Consumption in the combined area is difficult to estimate. The current consumption requirements of the Soviet bloc are probably considerably above metal production of about 225,000 tons per year. Western European consumption in 1951 and 1952, owing to increased production for defense, is expected to total about 470,000 to 500,000 tons annually, even though conservation measures are adopted.

By late 1952, it is probable that essential civilian requirements in Western Europe would be severely restricted to about 100,000 tons or less per year. Only a small part of this could be supplied by secondary recovery. Thus, in 1952-53, assuming that about 330,000 tons of zinc would be produced annually in Western Europe from

domestic ores, over 200,000 tons would be available to support increased military production in Western Europe or in the USSR and satellite countries. The NATO program will require, by mid-1952, about 80,000 to 100,000 tons of zinc annually. This program would probably be continued and expanded by the Soviets, unless requirements for direct military purposes in the USSR, for example, in cartridge brass, were considerably increased.

ZINC

ESTIMATED PRODUCTION, PRODUCTION CAPACITY, AND INVENTORY
WESTERN EUROPE AND SOVIET BLOC[a]

(Unit measure: 000 metric tons)

Country	Primary metal production 1951	Mine production 1951[b]	Annual mine production rate mid-1952[b]	Peak annual mine production World War II	Primary metal production capacity 1951	Primary metal production capacity mid-1952	Annual Mine production rate mid-1953	Annual Mine production rate mid-1954[b]
Grand Total	806	527	563		1,006	1,006	609	620
Western Europe:	581	302	310		654	654	340	340
Austria		2	2	NA			3	3
Belgium	200				220[c]	220[c]		
Finland		2	3	3 (42)			3	3
France	76	13	14	3 (45)	108	108	16	16
Italy	43	74	76	74 (42)	54	54	88	88
Netherlands	24				24	24		
Norway	43	7	7	5 (44)	47	47	7	7
Spain	22	63	63	37 (41)	25	25	63	63
Sweden		30	34				37	37
West Germany	160	75	75	NA	160	160	87	87
Yugoslavia	13	36	36	16 (41)	16	16	36	36
Soviet Bloc:	225[d]	225[d]	253		352	352	269	280
USSR	105	105	110	86	156[e]	156[e]	115	120
Poland	100	100	120	118	180[f]	180[f]	130	135
Czechoslovakia[g]								
East Germany[h]								
Hungary	*	*	*	NA			*	*

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Country	Primary metal production 1951	Mine production 1951[b]	Annual mine production rate mid-1952[b]	Peak annual mine production World War II	primary metal production capacity 1951	primary metal production capacity mid-1952	Annual mine production rate mid-1953	Annual mine production rate mid-1954[b]
Rumania	3	3	4	NA	i	i	4	5
Bulgaria	5	5	5	NA	i	i	6	6
Communist China[j]	4	4	5	NA	7[e]	7[e]	5	5
North Korea	8	8	9	NA	9[e]	9[e]	9	9

* Less than 500 metric tons.

a. No appreciable inventories are believed to exist, except in the USSR. The inventory in the USSR at the end of 1951 is estimated at 40,000 tons; in mid-1952 at 50,000 tons.

b. Recoverable basis.

c. Theoretical capacity of the Belgian zinc metal production industry is 324,000 tons. Practical capacity is about 220,000 tons. An additional 50,000 to 60,000 tons of capacity could be reactivated in a fairly short time if adequate supplies of concentrates and fuel were available.

d. Metal production is estimated at the same figure as the recoverable content of mine production.

e. Estimated capacity.

f. Rated capacity. Capacity of zinc smelting plants in Poland in 1939 totaled 181,000 tons, with an additional electrolytic capacity of 30,000 tons. Rehabilitation of zinc smelting plants after World War II was rapid. Information on electrolytic plants is not available.

g. Czechoslovakia has no production from ores; all zinc metal produced is from scrap, estimated at 3,000 tons in 1951 and 4,000 tons in 1952.

h. East Germany has no production from ores; all zinc metal produced is from scrap, estimated at about 3,000 tons annually.

i. Not available. Probably small.

j. Includes estimate for Inner Mongolia.

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ZINC

NOTES ON STATISTICAL DATA

1. Mine Production -- 1951 and 1952

Western Europe: Mine production of zinc, already at a high rate in 1951 compared to prewar years, is expected to increase only slightly in 1952. The principal source of the estimates shown for 1951 and 1952 is the Organization for European Economic Cooperation (OEEC). Data are given on a recoverable basis, assuming 90 percent recovery from concentration and 90 percent from retort or electrolytic plants.

Soviet Bloc: Mine production data were estimated after an extensive search of available information on past and present performance as well as on the various 2 to 5 and 6 year plans. Estimates are believed to be accurate within reasonable limits (plus or minus 10%).

2. Inventory

Western Europe: It is believed that, aside from normal working stocks, no appreciable inventories of lead exist or are likely to be established in 1951 or 1952.

Soviet Bloc: The estimate of the stockpile in the USSR is based on (1) acceptance of the estimate of returned prisoners of war that the stockpile of zinc in 1949 totaled 15,000 tons; and (2) the assumption that 10 to 15 percent of the yearly zinc metal production is shipped to the stockpile.

3. Production and Production Capacity for Primary Metal

Western Europe: Estimated metal production for 1951 is based on data presented to the International Materials Conference. The principal sources of capacity data are the yearbooks of the Societe Anonyme Minerais et Metaux and of the American Bureau of Metal Statistics.

Soviet Bloc: Estimated capacity in the USSR includes both distillation and electrolytic plants. Total electrolytic capacity is estimated at 112,000 tons per year and distillation capacity at 44,300 tons per year. Estimated capacity of Communist China is based on metal production in Manchuria and Free China for 1943 and in North Korea on reported production for eight months in 1950.

4. Estimated Annual Mine Production Rates — 1953 and 1954

Western Europe: The estimated annual mine production rate for 1953 is based largely on OEEC forecasts. Most of the expansion now scheduled is expected to be effective in 1953, with little increase in 1954. The scheduled increases are dependent on ECA aid.

Soviet Bloc: Zinc occurs in the USSR principally in polymetallic deposits also containing lead and copper. It also occurs in some copper-pyrite ores in the Urals. Production is limited by inefficiency of management and labor, poor utilization of mechanical equipment, and by failure to keep development work sufficiently ahead of mining.

Poland has large zinc ore reserves and also large smelting capacity. The zinc mining and smelting industry is well organized and, according to the 1950-1955 plan, the output of zinc is to be doubled during the period. This would mean a production of 180,000 to 200,000 tons a year in 1955. The accompanying estimate assumes some increase in production, but not as fast as planned. The principal limitation to production may be slow down and sabotage by labor. Information indicates labor unrest in other industries, which may spread to the zinc industry.

Very little increase in the production of zinc or zinc ores is anticipated in the other satellite countries. The ore reserves and mining facilities are small and not adaptable to large scale mining.

[redacted]

CHROMITE

ESTIMATED PRODUCTION AND INVENTORY
SOVIET BLOC AND WESTERN EUROPE

(Unit measure: 000 metric tons)

Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Inventory End-1951	Inventory Mid-1952	Annual production rate Mid-1953	Annual production rate Mid-1954
Grand Total	676	784	467	NA	NA	958	1,050
Western Europe:	25	30	102	Minimum levels		102	102
Portugal	-	-	2	NA	NA	2	2
Yugoslavia	25	30	100	NA	NA	100	100
Soviet Bloc:	651	754	365	a	b	856	948
USSR	600	700	360	a	b	800	890
Rumania	9	9	NA	None	None	9	9
Bulgaria	7	7	5	None	None	7	7
Albania	35	38	NA	Insign.	Insign.	40	42

a. At least 2 years supply.
b. 2-3 years supply.

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CHROMITE

NOTES ON STATISTICAL DATA

Western Europe

Yugoslavia supplied most of the requirements of Nazi occupied Europe during World War II and is likely to be a major supplier under the conditions stated in NIE 40. Some new mines are under development now and since reserves are ample, substantial expansion of production is possible.

Soviet Bloc

USSR: The USSR has large reserves of a good grade of chromite. From these deposits sufficient ore is extracted not only to meet the requirements of the iron and steel industry and those of the European Satellites, but also to satisfy the demands of the Ministry of State Reserves for its stockpiling program. There are no limiting factors which will prevent the production of chromite from keeping pace with the increasing demands of the Soviet Orbit industries and the building up of a Soviet stockpile. Production capacity is estimated at 900,000 tons, which could be raised if demands so required. It has been Soviet practice, over the past few years, to produce approximately double the amount of chromite needed for consumption. In 1950 output amounted to approximately 500,000 tons, of which 250,000 tons were used by the steel industry, 25,000 tons were exported, and 225,000 tons were turned over to the Ministry of State Reserves. It is assumed that this practice will continue.

Soviet Satellites: Only approximately 50,000 tons of chromite are mined in the Soviet Satellites. Of the three producing countries, Albania and Bulgaria have no steel producing facilities, and all chromite is exported. Rumanian production is not sufficient to satisfy require-

ments and must be supplemented by imports. Reserves of chromite in the European Satellites are not extensive, mining methods are primitive, and there will be little increase in production in the next few years. Supplies from domestic production plus imports do not permit stockpiling of chromite in any sizeable amounts by the Satellites.

[redacted]

MANGANESE ORE

ESTIMATED PRODUCTION AND INVENTORY
SOVIET BLOC AND WESTERN EUROPE

(Unit measure: 000 metric tons)

Country	Production 1951	Annual production rate Mid-1952	Peak annual production World War II	Inventory End-1951	Inventory Mid-1952	Annual production rate Mid-1953	Annual production rate Mid-1954
Grand Total[a]	4,066	4,576	2,469	NA	NA	4,752	5,062
Western Europe:	57	62	154	small		107	107
Italy	20	20	60	NA	NA	25	25
Portugal	10	15	13	NA	NA	40	40
Spain	17	17	30	NA	NA	30	30
Sweden	-	-	27	NA	NA	2	2
Switzerland	-	-	8	NA	NA	-	-
West Germany	-	-	2	NA	NA	-	-
Yugoslavia	10	10	14 (39)	NA	NA	10	10
Soviet Bloc:	4,009	4,314	2,315	2,000	2,500	4,645	4,955
USSR[a] (35% Mn)	3,850	4,150	2,250	2,000	2,500	4,450	4,750
East Germany (35% Mn)	20	20	18	Insign.	Insign.	30	30
Hungary (35-48% Mn washed ore)	40	45	NA	"	"	50	55
Rumania (30-36% Mn)	75	75	NA	"	"	80	85
Bulgaria (30-50% Mn)	4	4	25-30 (1943)	"	"	5	5
Communist China (35% Mn)	20	20	17	"	"	30	30

a. Production estimates based on Bureau of Mines calculations would result in a far lower level of estimates for the USSR. However, it is quite clear that even the lower estimates [redacted] would provide for sufficient supplies for all of the Soviet Bloc as well as Western Europe.

MANGANESE ORE

NOTES ON STATISTICAL DATA

Western Europe

Italy: In general, Italy's mines are small and high cost and therefore compete only with difficulty with imported ores. Moreover, a recent report attributes a drastic decline in 1950 production to "progressive depletion of deposits".

Portugal: Production in 1948 and 1949 have been rather negligible due to primitive mining methods. A great deal of mechanical equipment has been installed recently, however, and mining operations expanded. According to company plans, it is hoped eventually to reach a yearly rate of 60 thousand tons, but the quality and acceptability of this ore is in some doubt since an American company has canceled its contract for this ore. Moreover, previous production plans of this company have not been fulfilled. Reserves are estimated at 5-10 million tons.

Spain: Production was subsidized during World War II in order to meet domestic requirements. All the high grade deposits have been exhausted and remaining ores are low in manganese and high in silica (average = 35% mn.).

Sweden: The World War II peak output was boosted by re-opening old mines containing very low grade reserves and re-working old mine dumps. Future supplies from such sources are probably limited.

Western Germany: Most, if not all, Western Germany reserves are below 30% mn. content.

Soviet Bloc:

USSR: The USSR has vast reserves of good quality manganese, which is mined in quantities sufficient not only for the consumption of the iron and steel industry and the stockpiling program, but also for the needs of those satellite countries which are deficient in this important

raw material. In the past few years, the USSR has produced approximately 800 hundred thousand tons of manganese above consumption needs, of which one-half is exported and the remainder allocated to the State Reserve's stockpiling program. Production will increase with the needs of the Soviet Orbit steel industries.

Soviet Satellites: Of the European Satellites only Hungary and Rumania produce sufficient manganese for the needs of the steel industries. The other steel producing countries are dependent upon imports to supplement production or for total manganese requirements. Production and imports are not sufficient to permit stockpiling.

China has several large deposits of manganese, but little information is available on the amount of ore being extracted from the mines. It is assumed that production is sufficient for the needs of China's small steel industry. Production estimates are based upon requirements for the production of raw steel.

MAGNESIUM

DISCUSSION AND CONCLUSIONS

Production of magnesium is geared to current market demand, which, in turn, is closely allied to the manufacture of armaments. Plant capacity in continental Western Europe plus the Soviet bloc, including potential capacity in Western Germany which is partially dismantled, is estimated at 30,500 metric tons on an annual basis. Raw materials are available within the area.

VANADIUM

DISCUSSION AND CONCLUSIONS

There is currently no indigenous production of vanadium in Western Europe. During World War II estimated annual capacity in Axis Europe for processing vanadium from iron ore slags was about 1000 metric tons. Production was discontinued after the war. Estimated vanadium production in the Soviet bloc during 1951 is 1425 tons and is expected to attain annual rates of 1725 tons and 1825 tons by mid-1953 and mid-1954 respectively. Current vanadium production in the Soviet bloc apparently meets consumption and stockpile requirements.

It is estimated that vanadium requirements for the combined area could be met during the period under consideration by exports from the present Soviet bloc to Western Europe and the reactivation of indigenous vanadium production in Western Germany.